CLAIMS:

1. A method for monitoring the effectiveness of a treatment against a disease state by monitoring, the level of at least one physiological parameter of a biological marker as compared to a control level, which is the level of the parameter without treatment, being either the level of the parameter in the individual prior to treatment or the level of the parameter in untreated control, the method comprising

(a) obtaining a sample of tissue, or cells associated from a subject having a disease state and being administered with a drug against the disease;

(b) detecting the level of at least one physiological parameter of at least one biological marker in said cells, the marker being an A3AR,or an element associated with the A3AR signal transudation pathway which is downstream to A3AR; and

(c) comparing the level of said at least one parameter of at least one marker to the level thereof in untreated cells being cells from the same subject before administration of said drug ,or being a standard reference for said marker which is indicative of a n un treated disease state;

wherein a difference in level of the physiological parameter between the treated and untreated cells between indicative of the effectiveness of said treatment against these state.

2. The method of claim 1 wherein the treatment is administration of an A3AR modulator

3. The method according to claim 2 wherein the A3AR modulator is an A3AR agonist.

4. A method according to claim 1 wherein the A3AR signal transduction pathway is the Wnt pathway.

5. A method according to claim 4 wherein the element is at least one element selected from: ,PKA ,PKB/Akt ,GSK-3β ,β-catenin. Cyclin D1 ,c-myc.,

6. A method according to claim 1 wherein the A3AR signal transduction pathway is the NF-kB pathway.

7. A method according to claim 6 wherein the element is at least one element selected from: NF-kB,c-myc, cyclin D1.

8. A method according to claim 1 wherein the physiological parameter is selected from: the level of mRNA or protein expression, the level of phosphoryalation and the cellular localization..

9. The method of Claim 1, wherein said disease state is a proliferative-related disease.

10. The method of Claim 9, wherein said disease is cancer.

11. The method of Claim 10, wherein said cancer is melanoma, colon carcinoma or prostate cancer.

12. The method according to claim 9 wherein effective treatment against the disease is indicated by a change in a physiological parameter of a biological marker selected from:

(a)_ a decrease of the protein level or the mRNA level coding therefore of at least one of A3AR, PKB/Akt, PKA, β-catenin, c-myc, cyclin D1 and NF-$_{\kappa}$B, ;or increase in the protein level or mRNA coding therefore of GSK-3β

(b) at least one change in phosphorylation level selected from: decrease in phosphorylation level of GSK-3β ,increase in the phosphorylation level of PKB/Akt , PKA or beta-catenin.

(c) at least one change in cellular localization selected from: decrease in the localization of A3AR receptor in the cellular membrane as compared to control, decrease in the localization of β-catenin or NF-kappa B in the nucleus as compared to cytosol.

13. A method according to claim 1, wherein said disease state is a disease or condition wherein a beneficial therapeutical effect is evident by increase proliferation.

14. The method of Claim 13, wherein said disease state is a decrease in white blood cell count, especially neutrophiles as a result of chemo-radio-therapy.

15. The method of claim 13 wherein effective treatment against the disease is indicated by a change in a physiological parameter of a biological marker selected from:

(a)_ increase of the protein level or of the level of mRNA coding therefore of at least one of A3AR, PKB/Akt, PKA, β-catenin, c-myc, cyclin D1 and NF-$_{\kappa}$B, or decrease in the protein or mRNA level of GSK-3β;

(b) at least one change in phosphorylation level selected from: increase in phosphorylation level of GSK-3β , decrease in the phosphorylation level of PKB/Akt ,PKA or in the phosphorylation level of beta-catenin.

(c) at least one change in cellular localization selected from: increase in the localization of A3AR receptor in the cellular membrane as compared to control, increase in the localization of β-catenin in the nucleus as compared to cytosol.

16. A method according to claim 1and 2 wherein the level of the at least one physiological parameter of the at lease one biological marker is determined at a time period after the administration of the A3Ar modulator, wherein the differences between the level of the parameter in the treated subject and the untreated control are the most prominent.

17. A method according to claim 3 wherein the A3AR agonist is 1-deoxy-1-[6[[(3-iodophenyl)methyl] amino]-9H-purine-9-yl]- N-methyl-β-D- ribofura-nuronaminde (IB-MECA).